

**UNIT – I**  
**OVERVIEW OF BUSINESS FUNCTIONS**

- Business function in an organization,
- Material management,
- Scheduling,
- Shop floor control.
- Forecasting,
- Accounting & finance,
- Human resources,
- Productivity management.

**1. INTRODUCTION**

An organization is the group of people with specific responsibilities acting together for achieving specific purpose determined by the organization. An organization is an entity where two or more persons work together to achieve a goal or a common purpose. There are so many organizations around us. Daily we visit and see many organizations like hospitals, colleges, factories, farms and government offices. Mosque/church is also an example of an organization. People go there and say prayers and activities of praying are to achieve a certain goal. Similarly, any unit in which two or more persons are working together for some purpose is called an organization.

If there is an organization, then there must be some people who work as a whole for a common purpose, so there must be a defined purpose. If an organization does not have any purpose, it will not survive in the long run. To achieve the purposes by using people, the processes are needed. Without any process, you cannot achieve any type of purpose or goal. If we see in our daily life, we have some goals. For achieving these goals, we use some processes. So that process is also obvious and important for an organization.

The last important thing for any organization is that it requires main pillars of management i.e.

POLCA:

1. Planning
2. Organizing
3. Leading
4. Controlling

A manager must perform all these management functions with assurance.

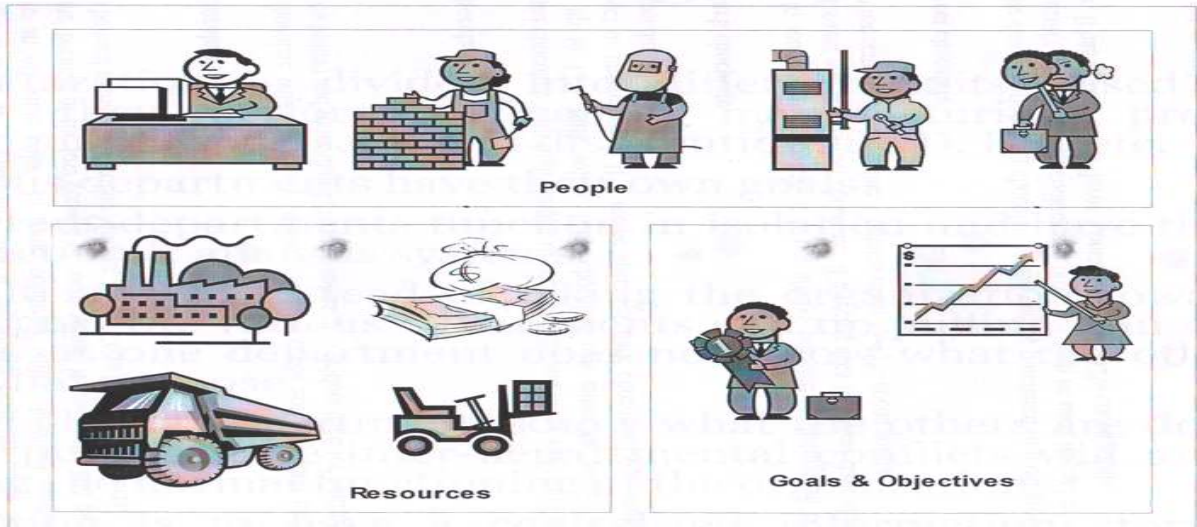


Figure 1.1 Organization

## 2. BUSINESS FUNCTION IN AN ORGANIZATION

All organizations are divided into many departments or sections, with each department having an assigned functional responsibility. The various departments have their own goals. The different departments function in isolation and have their own data collection and analysis systems. The result is that, instead of taking the organization towards the common goal the various departments end up pulling it in different directions as one department does not know what the other does and for what purpose. So unless all the departments know what the others are doing and for what purpose, the inter-departmental conflicts will arise thus disrupting the normal functioning of the organization.

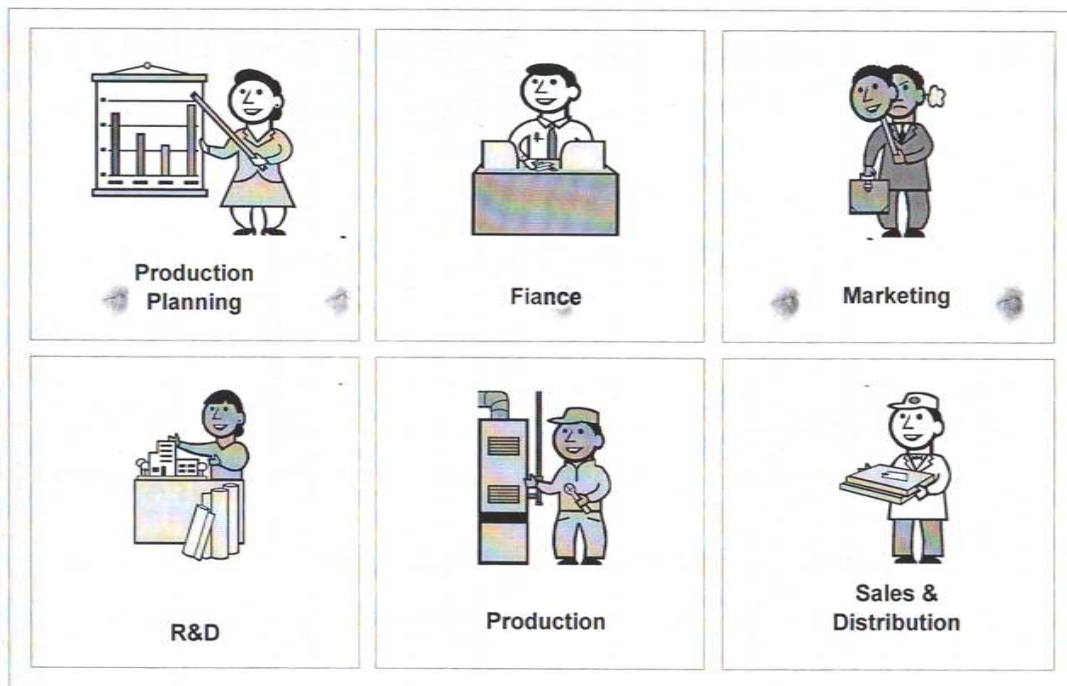


Figure 1.2 Organization where there is no or little Communication between Departments

Consider, for example, an educational institute such as large University. It will typically have, besides academic departments, a central administrative office. The administrative office will be divided into many sections, each with an assigned function.

Typically the functions will be:

- Student section
- Account section
- Purchase section
- Stores section
- Human resource section
- Medical section
- Student hostel office

Division of an organization into departments with specified functions is mainly intended to let each department focus on an area of responsibility. All departments will have to coordinate their activities to meet the overall objectives of the organization. This coordination is normally provided by higher level management in the organization.

**Table 1.1 Functions of Various Departments of a University**

<i>Administrative Offices</i>	<i>Functions</i>
Student section	Students' admission records Administering admission tests Students' academic records Students' registration information Placement
Accounts section	University budget Payroll General ledger of receipts/payments Scholarships
Purchase section	Order processing Vendor selection Stock register maintenance Issues Receipts
Hostel Office	Mess records Hostel purchases/stores Room assignment Residents' data
Medical Centre	Medical records Medicine purchase/stores
Works Department	Building construction Building maintenance Maintenance of electrical installation and water supply Maintenance of roads, gardens
Human Resource	Personal records (leave, tenure) Assessment of employees Recruitment
Miscellaneous	Mailing Telephones Transport

**Table 1.2 Functions of Various Departments of a Manufacturing Organization**

Sections	Functions
Production	Production planning and control Maintenance management Bill of materials processing
Marketing	Advertising Customer records/follow up Sales analysis
Finance	Billing, payments Payroll Costing Share accounting Budget and finance planning Tax planning Resource mobilization
Human Resource	Recruitment Records Training Deployment of labour Assessment/promotions
Stores (Materials Management)	Stock ledger keeping Issues/reorder Receipts Enquiry processing
Maintenance	Physical facilities Communication facilities Electricity and water supply
Research and Development	Production improvement Product development Product testing Product design

### 3. MATERIAL MANAGEMENT

Materials Management is a function, which aims for integrated approach towards the management of materials in an industrial undertaking. Its main objective is cost reduction and efficient handling of materials at all stages and in all sections of the undertaking. Its function includes several important aspects connected with material such as purchasing, storage, inventory control, Material handling, standardization etc.

#### 3.1 Scope of material management

Material management is defined as the function responsible for the coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide a pre-decided service to the customer at a minimum cost.

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The functions of materials management can be categorized as:

1. **Materials planning and Control:** Based on the sales forecast and production plans, the materials planning and control is done. This involves estimating the individual requirements of parts, preparing materials budget, forecasting the levels of inventories, scheduling the orders and monitoring the performance in relation to production and sales.
2. **Purchasing:** This includes selection of source of supply finalization, placement of purchase orders, follow-up, maintenance of smooth relations with suppliers, approval of payments to suppliers, evaluating and rating suppliers.
3. **Stores Management:** This involves physical control of materials, preservation of stores, minimization of obsolescence and damage through timely disposal and efficient handling, maintenance of stores records, proper location and stocking. A store is also responsible for the physical verification of stocks and reconciling them with book figures. A store plays a vital role in the operations of a company.
4. **Inventory control:** inventory generally refers to the materials in stock. It is also called the idle resource of an enterprise. Inventories represent those items, which are either stocked for sale or they are in the process of manufacturing or they are in the form of materials, which are yet to be utilized. The interval between the receiving the purchased parts and transforming them in to final products varies from industries to industries depending upon the cycle time of manufacturer, it is therefore necessary to hold inventories of various kinds to act as a buffer between supply and demand for efficient operation of the system. Thus, an effective control on inventory is a must for smooth and efficient running of the production cycle with least interruptions.

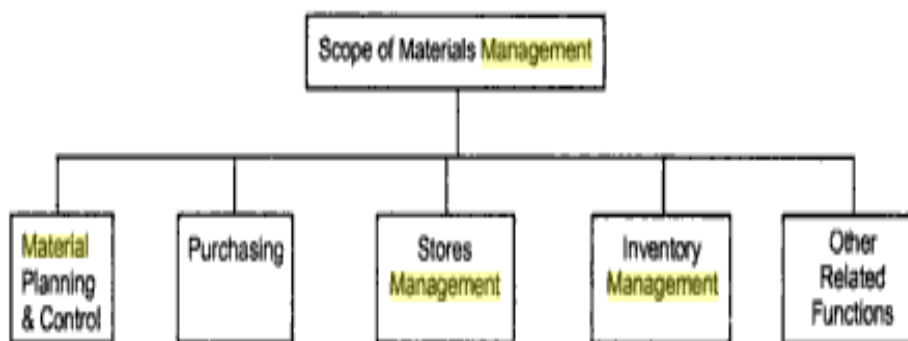


Figure 1.3 Scope of material management

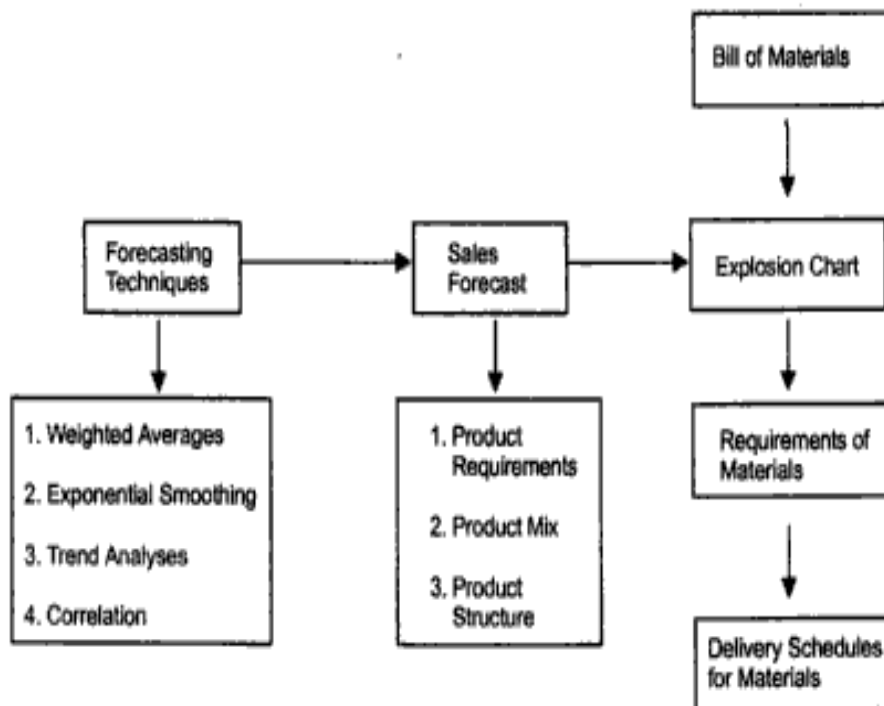
### 3.2 Material planning and budgeting

Material planning is a scientific technique of determining in advance the requirements of raw materials, ancillary parts and components, spares etc. as directed by the production program. It is a sub-system in the over all planning activity. There are many factors, which influence the activity of material planning. These factors can be classified as macro and micro systems.

1. Macro factors: Some of the micro factors which affect material planning, are price trends, business cycles Govt. import policy etc.
2. Micro Factors: Some of the micro factors that affect material planning are plant capacity utilization, rejection rates, lead times, inventory levels, working capital, delegation of powers and communication.

### 3.3 Techniques of material planning

One of the techniques of material planning is bill of material explosion. Material planning through bill of material explosion is shown in figure 1.4.



**Figure 1.4 Material planning**

## 4. SCHEDULING

Scheduling is committing resources to the realization of an event at a defined time. Scheduling is committing resources to a plan. This module assists in simplifying the administration and evaluation of time data. Time management or scheduling is a powerful tool which helps in administer and evaluate data related to the time employees spend working. This component can simplify efforts irrespective of whether the organization uses centralized or decentralized data to determine employee working hours. Time management manages work schedules efficiently and effectively by automating schedule generation and allowing flexible definition of time models and schedules per location and organization level. With time management, can set flexible working hours and process work notices as times are recorded. Individual and group piecework calculation for employee's incentive wages is also available through the incentive wages feature. The time evaluation component allows daily processing of employee time data. It is a flexible tool designed to handle complicated evaluation rules to fulfill regulatory requirements and

determine overtime and other time-related data. The time evaluation component stores organization's business rules and automatically validates hours worked and wage types. The results of time evaluation can be depicted on a time sheet which provides a detailed overview of daily balances and time wage types. Most packages provide a review of feature which will provide all necessary information and tools to review and maintain employee time data.

#### 4.1 Purpose of scheduling

- Minimize the production cost
- Minimize the production time
- Maximize the efficiency of the operation

Companies use backward and forward scheduling to allocate

- Plant and machinery resources
- Plan human resources
- Plan production processes
- Purchase materials

**Forward scheduling** is planning the tasks from the date resources become available to determine the shipping date or the due date.

**Backward scheduling** is planning the tasks from the due date or required date to determine the start date.

#### Scheduling algorithm

- Heuristic algorithm
- Stochastic algorithm

### 5. SHOP FLOOR CONTROL

The actual implementation starts with shop floor control (SFC, also called production activity control-PAC). The SFC or PAC module monitors all shop floor activities and communicates status information on manufacturing orders and work centers back to respective managers.

SFC determines what orders are released to the floor and when, the routing of a particular order, when operations are to be started and completed. It also maintains the paperwork and details concerning an order, and gives feedback (either manual or automated) on the status of an order. Dispatch lists are generated, showing the jobs coming into a work centre and the preferred order of their completion. SFC reacts to changes and reschedules the work in response to priority changes. It also interfaces with the Capacity Requirements Planning component to provide input/output data for capacity planning purposes. With this process, overloaded or under loaded work centers can be identified to provide more effective work centre utilization.

With increasing emphasis being placed upon reducing manufacturing time in support of the need to reduce product time to market, manufacturers have turned greater attention to evaluating their shop floor activities. Process reengineering efforts and the elimination of waste have necessitated greater reliance upon powerful, user-friendly, flexible shop floor planning and control systems. Management needs timely, accurate information and the ability to manage the shop floor by



exception. Cost information must be flexible as well. Factories are being realigned to reduce material travel time through a facility. This realignment places an added burden upon the supporting systems. Managers must often time experiment with trial-and-error approaches in the never-ending search for process improvement. Shop floor control systems must be flexible and adaptable to changing needs.

A shop order can be reprinted at any time with user selection of whether to reallocate material. This reprinting gives a shop foreman flexibility to print a duplicate copy when an order is split between operators. This feature also gives the shop scheduler, the ability to reprint the shop packet and to reflect new material allocations that correct previous shortages. Every shop order can be maintained through out its life. All systems provide a full function shop order maintenance capability, allowing the user to evaluate and adjust operation steps and components. Orders can be rescheduled either backward or forward. For example, an operation's start date can be overridden to reflect changed events and then the order can be forward scheduled to reflect the impact upon future operation.

## 6. FORECASTING

**Forecasting** is the process of estimation in unknown situations. It is a method for translating past experience into estimates of the future. It is one of the oldest mathematical activities in business. The computer enabled the forecasters to make the calculations much more quick and easy. In considering the contribution that forecasting can make to the firm, should keep three basic facts in mind:

- I. **All forecast are projections of the past:** The best basis for predicting what will happen in the future is to look at the past. All types of forecasting follow this approach. This is the reason why accounting data is so important in forecasting; it provides the historical base.
- II. **All forecasts consist of semi-structured decisions:** Forecasting decisions are a good example of the semi-structured type of decisions that are supported by the DSS. The decisions are based on some variables that can be easily measured and some that cannot.
- III. **No forecasting is perfect:** Not even the most sophisticated main frame forecasting package can be expected to predict the future with 100 percent accuracy.

Since managers are aware of these facts, they apply much judgment in using the forecasts as a basis for future planning.

### Key questions which must be answered:

- What is the purpose of the forecast?
- What specifically do we wish to forecast?
- How important is the past in predicting the future?
- What system will be used to make the forecast?

### Forecasting horizons:

- long-term: more than 2 years
- medium-term: 3 months to 2 years
- short-term: 0 to 3 months

## 6.1 Forecasting Methods

### 6.1.1 Non- quantitative (Qualitative methods):

**Non- quantitative Methods:** A non- quantitative forecasting method does not involve computations of data but is based on subjective estimates. The manager applies such reasoning as-“We sold two thousands units last year, and we should be able to improve on that. So I think we will sell twenty-five hundred next year.”

Forecast such as these may make it seem as if the manager is flying by the seat of the pants, but they can result from an insight into the business that comes from years of experience. Many managers are very good at the non- quantitative approach.

Some firms have established a formal system that encompasses non- quantitative methods. Three such formal systems are:

- a. **Panel Consensus:** This technique consists of a group of experts who openly discuss the factors bearing on the future and arrive at a single projection based on the combined inputs. The experts can meet on a regularly scheduled basis, follow a prescribed agenda, and have the discussion recorded in a written form. Such sessions rely on face-to –face dialogue in a conference room setting.
- b. **Delphi method:** It involves a group of experts who do not meet in person but instead submit responses to a series of questionnaires that are prepared by a coordinator. Each round of questionnaires incorporates inputs from previous rounds, thus gradually refining the content.
- c. **Electronic meeting system:** An electronic meeting system (EMS) is a type of computer software that facilitates group decision-making within an organization. To work with such a system, networked computers, a projection screen, and EMS software are required. The term was coined by Jay Nunamaker et al. in 1991. The term is synonymous with Group Support Systems (GSS) and essentially synonymous with Group Decision Support Systems (GDSS). An electronic meeting system is a suite of configurable collaborative software tools that can be used to create predictable, repeatable patterns of collaboration among people working toward a goal. With an electronic meeting system, each user typically has own computer, and each user can contribute to the same shared object at the same time. Thus, nobody needs to wait for a turn to speak; so people don't forget what they want to say while they are waiting for the floor. When a group or a group leader deems it appropriate, people can contribute anonymously to most electronic meeting systems tool, so the group can focus on the content and meaning of ideas, rather than on their sources. Anonymous contributions are particularly useful when a team is generating or evaluating ideas. It is less useful when a team is establishing the agreed meaning of ideas, or building consensus.

### 6.1.2 Quantitative methods

**Quantitative Methods:** A quantitative forecasting method involves computations of data.

#### a. Trend analysis

An aspect of technical analysis that tries to predict the future movement of a stock based on past data. Trend analysis is based on the idea that what has happened in the past gives traders an idea of what will happen in the future.

Typical sales trend analysis includes;

- Which customer segments are having highest growth in dollar terms?
- Which customer segments are having highest revenue decline in dollar terms?
- Which customer segments are having highest growth rates in percentage terms?
- Which customer segments are having highest revenue decline rates in percentage terms?
- How solid the growth (or decline) trend is?
- Which customer segments are showing exponential growth (or decline)?

### **b. Weighted Moving average**

One, very simple, method for time series forecasting is to take a *moving average* (also known as weighted moving average).

The moving average ( $m_t$ ) over the last  $L$  periods ending in period  $t$  is calculated by taking the average of the values for the periods  $t-L+1, t-L+2, t-L+3, \dots, t-1, t$  so that

$$m_t = [Y_{t-L+1} + Y_{t-L+2} + Y_{t-L+3} + \dots + Y_{t-1} + Y_t]/L$$

To forecast using the moving average we say that the forecast for all periods beyond  $t$  is just  $m_t$  (although we usually only forecast for one period ahead, updating the moving average as the actual observation for that period becomes available).

Consider the following example: the demand for a product for 6 months is shown below - calculate the three month moving average for each month and forecast the demand for month 7.

Month	1	2	3	4	5	6
Demand (100's)	42	41	43	38	35	37

Now we cannot calculate a three month moving average until we have at least 3 observations - i.e. it is only possible to calculate such an average from month 3 onward. The moving average for month 3 is given by:

$$m_3 = (42 + 41 + 43)/3 = 42$$

and the moving average for the other months is given by:

$$m_4 = (41 + 43 + 38)/3 = 40.7$$

$$m_5 = (43 + 38 + 35)/3 = 38.7$$

$$m_6 = (38 + 35 + 37)/3 = 36.7$$

We use  $m_6$  as the forecast for month 7. Hence the demand forecast for month 7 is 3670 units.

**c. Single exponential smoothing**

One disadvantage of using moving averages for forecasting is that in calculating the average all the observations are given equal weight (namely  $1/L$ ), whereas we would expect the more recent observations to be a better indicator of the future (and accordingly ought to be given greater weight). Also in moving averages we only use recent observations; perhaps we should take into account all previous observations.

One technique known as exponential smoothing (or, more accurately, single exponential smoothing) gives greater weight to more recent observations *and* takes into account all previous observations.

Define a constant  $\mu$  where  $0 \leq \mu \leq 1$  then the (single) exponentially smoothed moving average for period  $t$  ( $M_t$  say) is given by

$$M_t = \mu Y_t + \mu(1 - \mu)Y_{t-1} + \mu(1 - \mu)^2 Y_{t-2} + \mu(1 - \mu)^3 Y_{t-3} + \dots$$

Hence the exponentially smoothed moving average for period  $t$  is a linear combination of the current value ( $Y_t$ ) and the previous exponentially smoothed moving average ( $M_{t-1}$ ).

The constant  $\mu$  is called the *smoothing constant* and the value of  $\mu$  reflects the weight given to the current observation ( $Y_t$ ) in calculating the exponentially smoothed moving average  $M_t$  for period  $t$  (which is the forecast for period  $t+1$ ). For example if  $\mu = 0.2$  then this indicates that 20% of the weight in generating forecasts is assigned to the most recent observation and the remaining 80% to previous observations.

Note here that  $M_t = \mu Y_t + (1 - \mu)M_{t-1}$  can also be written  $M_t = M_{t-1} - \mu(M_{t-1} - Y_t)$  or current forecast = previous forecast -  $\mu$ (error in previous forecast) so exponential smoothing can be viewed as a forecast continually updated by the forecast error just made.

Consider the following example: for the demand data given in the previous section calculate the exponentially smoothed moving average for values of the smoothing constant  $\mu = 0.2$  and  $0.9$ . We have the following for  $\mu = 0.2$ .

$$\begin{aligned} M_1 &= Y_1 = 42 \text{ (we always start with } M_1 = Y_1) \\ M_2 &= 0.2Y_2 + 0.8M_1 = 0.2(41) + 0.8(42) = 41.80 \\ M_3 &= 0.2Y_3 + 0.8M_2 = 0.2(43) + 0.8(41.80) = 42.04 \\ M_4 &= 0.2Y_4 + 0.8M_3 = 0.2(38) + 0.8(42.04) = 41.23 \\ M_5 &= 0.2Y_5 + 0.8M_4 = 0.2(35) + 0.8(41.23) = 39.98 \\ M_6 &= 0.2Y_6 + 0.8M_5 = 0.2(37) + 0.8(39.98) = 39.38 \end{aligned}$$

Note here that it is usually sufficient to just work to two or three decimal places when doing exponential smoothing. We use  $M_6$  as the forecast for month 7, i.e. the forecast for month 7 is 3938 units.

We have the following for  $\mu = 0.9$ .

$$\begin{aligned} M_1 &= Y_1 = 42 \\ M_2 &= 0.9Y_2 + 0.1M_1 = 0.9(41) + 0.1(42) = 41.10 \\ M_3 &= 0.9Y_3 + 0.1M_2 = 0.9(43) + 0.1(41.10) = 42.81 \end{aligned}$$

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$$M_4 = 0.9Y_4 + 0.1M_3 = 0.9(38) + 0.1(42.81) = 38.48$$

$$M_5 = 0.9Y_5 + 0.1M_4 = 0.9(35) + 0.1(38.48) = 35.35$$

$$M_6 = 0.9Y_6 + 0.1M_5 = 0.9(37) + 0.1(35.35) = 36.84$$

As before  $M_6$  is the forecast for month 7, i.e. 3684 units.

#### **d. Correlation**

It is a statistical measurement of the relationship between two variables. Possible correlations range from +1 to -1. A zero correlation indicates that there is no relationship between the variables. A correlation of -1 indicates a perfect negative correlation, meaning that as one variable goes up, the other goes down. A correlation of +1 indicates a perfect positive correlation, meaning that both variables move in the same direction together.

### **7. ACCOUNTING AND FINANCE**

Accounting and finance personnel record the company's transactions in the books of account. Functions within accounting and finance include recording raw data about transactions, including sales, raw material purchases, payroll, and receipt of cash from customers. Those data are then summarized in meaningful ways to determine the profitability of the lemonade stand and to support decision making.

For example, they record accounts receivable when sales are made and cash receipts when customers send in payments. Additionally, they record accounts payable when raw materials are purchased and cash outflows when they pay for materials. Finally, accounting and finance personnel summarize the transaction data to prepare reports about the company's financial position and profitability.

People in other functional areas provide data to accounting and finance. Marketing and sales provides sales data, production and materials management provides production and inventory data, and human resources provides payroll and benefit expense data. The accuracy and timeliness of accounting and finance data depend on the accuracy and timeliness of marketing and sales and production of materials management data.

Marketing and sales personnel require data from accounting and finance to evaluate customer credit. If a customer's order will cause him to exceed his credit limit, marketing and sales must see that the customer's accounts receivable balance is too high and hold new orders until the customer's balance is lowered. If accounting is slow to record sales or customer's payments, then accounts receivable balances are inaccurate. As a result, credit might be approved for customers who have already exceeded their credit limit and may never pay off their account. In a similar way, it would also be possible to deny credit to customers who actually owe less than their credit limit, potentially damaging the relationship with the customer.

### **8. HUMAN RESOURCES**

Human resources management is an essential factor of any successful business. The competitive environment of the next millennium, with its economic and technological challenges, will affect the HR department in the same way it will affect all the other areas of your enterprise. In brief, HR managers should continually review and optimize their business processes.

A human resource management system has to be adaptable to company specific requirements and must constantly grow with increasing HR requirements. It must cover all the functions required in business practices. It must be flexible enough to allow you to optimize your business processes by tailoring the ERP solution to suit your organization's requirements. Today, many businesses cross boundaries. The system must support the organization's international needs with country-specific versions of the HR components. Apart from languages, currencies and legal requirements, accounting systems often vary from one country to another as well, making this a vital feature. A flexible structure enables quick and easy customization of the system to suit your requirements. When you log on in a particular language, screens, messages and documents appear in the language you specify. Then you have access to the system's complete functionality.

## **8.1 HRM Function in the Organization**

The HRM Function in the organization plays the role of the unit taking care of the human capital. The HRM Function is responsible for the processes, which allow the organization to stay competitive on the external market and internally efficient.

The HRM Function plays a different role in the manufacturing company and a completely different role it plays in the high tech IT Company. The investments needed to keep the current staff and the competition on the market usually define the playground for the HRM Function.

The HRM Function is responsible for the following areas in the organization or the business:

- Recruitment
- Compensation and Benefits
- Performance Management
- Training
- Reporting
- Leadership Development
- Personal Administration
- Legal Compliant Processes

The HRM Function can be a strong player in the organization with a significant impact on the overall results of the organization. But also, in the organization its role and responsibility can be reduced on the pure Personal Administration, just taking care of satisfying the needs of the top and line management.

## **8.2 HR Role in the Organization**

**HR Role** in the organization is quickly changing, HRM has been developing for several decades and the function is not that mature as many people would expect. The real concept of Human Resources responsible for the human capital inside the organization evolved in the early 70ies of the 20th century.

**HR Role in the organization** is changing from the industry to the industry and it also depends a lot on the country, in which the organization operates. The dream position of every HRM Department is to become a fully recognized business partner. HRM gets more and more responsibilities and participates on strategic initiatives in the organization.

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The **role of HR** is very dependent on the employees and management in the HR Department. Many times, the HRM Function does not work with sophisticated processes, but the employees inside are so mature, the HR Role and HR Position are very visible to the rest of the organization.

This chapter is focused on description of the **HR Role** inside the organization and its potential consequences to the other HR Processes and to the HR Organizational Structure.

### **8.3 Organizational structure of Human Resources**

The organizational structure of Human Resources is usually very flexible and it reflects the immediate needs of the organization. There is no modern organization, where the HRM Organizational Structure stayed the same for more than 18 months.

## **9. PRODUCTIVITY MANAGEMENT**

### **9.1 Introduction**

**Productivity** in economics refers to measures of output from production processes, per unit of input. Labor productivity, for example, is typically measured as a ratio of output per labor-hour, an input. Productivity may be conceived of as a measure of the technical or engineering efficiency of production. As such quantitative measures of input, and sometimes output, are emphasized. Productivity is distinct from measures of allocative efficiency, which take into account both the value of what is produced and the cost of inputs used, and also distinct from measures of profitability, which address the difference between the revenues obtained from output and the expense associated with consumption of inputs.

Productivity is about how well an organization converts resource inputs into goods or services. Workplace productivity is about how firms can utilize labor and skills, innovation, technology and organizational structure to improve the quantity and quality of their output. Basically it's about exploring all the ways that can make a working environment more efficient.

Before ERP systems, each department in an organization would most likely have their own computer system, data and database. Unfortunately, many of these systems would not be able to communicate with one another or need to store or rewrite data to make it possible for cross computer system communication. For instance, the financials of a company were on a separate computer system than the HR system, making it more intensive and complicated to process certain functions.

Once an ERP system is in place, usually all aspects of an organization can work in harmony instead of every single system needing to be compatible with each other. For large organizations, increased productivity and less types of software are a result.

### **9.2 Why is productivity important?**

- i. Basis for improvements in real incomes and economic well-being.
- ii. Monetary policy (inflationary pressures)
- iii. Fiscal policy (financing of health, education, welfare)
- iv. Slow productivity growth = conflicting demands for distribution of income more likely

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Productivity is an efficiency of the production system which is expressed by the ratio between output and input. For example when the tailor is able to reduce the length of cloth used per shirt by adopting an improved cutting technique, the input (cloth) per shirt reduces while the output (shirts) remains constant. Thus, there is an increase in productivity, in the utilization of material (cloth).

Productivity is a measure of how much input is required to produce a given output, i.e., the ratio output/input is called productivity.

Productivity of a production system is analogous to the efficiency of a machine. Productivity can also be defined as human efforts to produce more and more with less and less inputs of resources as a result of which the benefits of production are distributed among maximum number of people.

European productivity council defines “productivity is an attitude of mind. It is a mentality of progress, of the constant improvement of that which exists. It is the certainty of being able to do better than yesterday and continuously. It is constant adaptation of the economic and social life to changing conditions. It is the continual effort to apply new techniques and methods. it is the faith in human progress.”

When we consider an industry as a whole, the productivity can be expressed in terms of the ratio between the value of the goods and services produced to the value of the resources utilized for this production. Thus,

Productivity = value of goods and services produced/ value of resources utilized for this production

So, productivity refers to efficient utilization of the resources. The resources utilized for production are:

**Land and Building:** Land is a convenient location on which the buildings and other facilities necessary for the operation of manufacture are needed.

**Machines:** Plant, equipment and tools necessary to carry out operations of manufacture and the transport of materials, heating, ventilating and power plant; office equipment and furniture.

**Materials:** Materials that can be converted into products to be sold. They include fuel, chemicals for use in the process of manufacture, packing and other indirect materials etc.

**Manpower:** Man and woman to perform the manufacturing operations; to plan and control, to do clerical work; to design and to research; to buy and sell.

The use of all these resources combined together determines the productivity of the enterprises. Since, higher productivity means more output from the same resources, it also means lower money costs and higher net money returns per unit of output.

Every management tries to improve the productivity. The productivity can be improved broadly by the following two ways:

- a. Increase the resources and there by production
- b. Efficient utilization of resources.



According to the first method if we increase the resources such as labor, machines, materials etc, the productivity may improve but there are limitations to increase the resources as it needs more capital investment. Secondly, after increasing the resources above certain limit, it is possible that the production may rise but in small proportion as compared to increase in input and hence the production may decrease. The second method requires little capital investment to improve the productivity.

Productivity of the enterprise will be increased when:

- a. The quality and quantity of output is increased by better management, by using best possible method study, while the input remains the same.
- b. The input is reduced by avoiding waste in all forms.
- c. For better utilization of existing resources, a small increase is made in the inputs resulting in a large increase in output.

Attempts for improving the productivity of an industrial enterprise will have to be directed towards these three areas.